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AUTHOR Poggio, John P.; Fabry, Julian
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ABSTRACT

Results of a study investigating the extent of relationship between inventoried interests using the SVIB and expressed interests coded using each of the vocational classification schemes suggested by Holland, Roe, and Strong is reported. Expressed vocational choice as well as scores on 35 of the Strong Vocational Interest Blank (SVIB) were collected on 248 subjects. Employing canonical analysis between the SVIB scale scores and each of the expressed choice coding schemes, a high degree of similarity across the three separate classification schemes was found. However, redundancy coefficients between the SVIB and the expressed choice coding schemes revealed only marginal relationships. (Author)

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The Factor Compatibility and Communality of Coded-Expressed and Inventoried Interests

John P. Poggio
University of Kansas

and

Julian Fabry
University of Nebraska, Omaha

Paper presented at the Annual Meeting of the American Education Research Association, Washington, D.C., 1975.

The Factor Compatibility and Communality of Coded-Expressed and Inventoried Interests

John P. Poggio
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University of Nebraska, Omaha

An often studied variable in educational research is student interest. Such indices are most frequently obtained by one of two methods: some indication by the student of an expressed choice, or secondly, indices are found through the administration of an interest inventory (e.g., Strong Vocational Interest Blank (SVIB), or the Kuder Vocational Preference Record). Researchers have long been concerned with the relationship between expressed and inventoried interests. The concern is a real one both from a hueristic perspective and at a more applied level. The critical concern relates to the questions of convergent and concurrent validity. More recently expressed choices of vocational interest have received the attention of researchers in light of the development of models that purport to validly classify expressed choices and thus provide a vehicle for experimental and/or applied investigations.

Much effort has gone into attempts to define the patterns of relationship that may exist between expressed and inventoried interests (Berdie, 1950; Campbell, 1968; Crites, 1969; Dolliver, 1969; Remstad and Rothney, 1958; Rose & Elton, 1970; Strong, 1952, 1953). These studies and others like them have primarily investigated this issue by means of bivariate correlational methodologies. Also, a number of different connotations have been used to indicate an individual's expressed choice. Terms such as "claimed", "stated" and "specified" have been used to denote an individual's expressed interests. For the purpose of this study, an expressed interest was operationally defined as any written statement made by an individual concerning a preference for a given occupation or general grouping (i.e., education, business, etc.) which had been identified independently of any interest inventory.

Reviewing the research literature one find the conclusion that there does appear to be a moderate degree of overlap between expressed and inventoried interests (Crites, 1969; Dolliver, 1969), yet almost concurrently the call for further, more exacting research into this question exists (Campbell, 1968; Rose and Elton, 1970).

The objective of the present investigation was to investigate the primary expressed vocational interest of students classified according to the vocational choice schema proposed by Roe (1972), Holland (1973) and Strong (1971), and the relationship between each classification scheme and the inventoried interests of these same subjects as measured by the SVIB. The resulting study examined the construct similarity of these three models for classifying expressed interests, as well as investigating the effectiveness of each model to parallel the assessments derived from a widely used interest inventory.

Methods and Procedures

The subjects participating in this study were 248 male students at a large midwestern university. Each student was asked to list in order of preference, occupations in which he would like to earn a living regardless of ability or availability of job opportunities. Subjects were also administered the SVIB which similarly asks the respondent to disregard ability and job opportunities in responding.

Each respondent's primary expressed interest was then dummy coded to represent one of the categories within each of the three classification schema. These values along with subject scores on 35 occupational scales from the SVIB served as experimental units for the study.

Classification of Expressed Interests. As was previously stated, the classification schema of Holland (1973), Roe (1972) and Strong (1969) were

selected to code each individual's primary expressed interest since these systems represent those most frequently used by counselors. Table 1 provides descriptions of these schema as well as the frequency of expressed choices falling in each category for the subjects in this study.

Insert Table 1

Holland's (1973) scheme is based on six basic types, each being a product of the individual's interaction between a variety of cultural and personal forces. Holland maintains that most individuals, environments and occupations can be categorized into one of the six major types. In addition, the individual's vocational choice is considered an expression of his personality.

Roe (1972) has represented various groups as ordered along a continuum which is conceived to represent the intensity and the nature of interpersonal relationships involved in the activities of the occupations. Roe maintains that various levels within occupations exist, and a third dimension which is not entirely clear at this time, may have some implication for the theory. Although these are part of the theory, only the groups have been used in the present study.

As Campbell (1971) has pointed out, Strong's arrangement of occupational groups is the result of several factor analyses and the visual inspection of the intercorrelations between the various occupational scales. His scheme results in eleven general categories or groupings of occupations.

Procedure. Each subject's primary expressed interest was coded to represent one of the categories within each of the three classification schema. The number of individuals classified within each category is reported in Table 1. As noted, some of the frequencies of expressed choice were not sufficiently large enough to be included in subsequent analyses. Only those categories identified by an

Table 1

Three Schema and Frequencies of Expressed Interests

Holland's scheme	N	Roe's scheme	N
Realistic	15	Service	12
*Investigative	118	Business contact	11
*Artistic	35	*Organization	22
*Social	32	*Technical	61
*Enterprising	44	Outdoor	8
Conventional	4	*Science	62
Total:	248	*General cultural	38
		*Arts & entertainment	34
		Total:	248

Strong's scheme	N
*Biological science	50
*Physical science	52
Technical supervisor	9
*Technical and trade skills	30
*Social service	44
Aesthetic/cultural	16
CPA owner	0
*Business and accounting	20
Sales	4
*Verbal/linguistic	21
President, Manufacturing concern	2
Total:	248

*Denotes those classifications with sufficient numbers of observations to be included in the data analysis.

asterisk were included for statistical analysis. These coded expressed interests were then dummy coded (i.e., assigned a value of one for the placement category and a zero for the remaining categories). These values along with subject scores on the 35 identified occupational scales from the SVIB served as the experimental units for the study. The 35 scales of the SVIB examined in this study are identified in Table 2.

The principal vehicle for the data analysis was canonical analysis. Three separate analyses were computed in order to estimate the canonical factor structures between each of the three classification schemes and the SVIB subscales. For each analysis completed there was computed the canonical correlations, canonical variates, redundancy coefficients, and the canonical factor structures for all statistically significant factors ($p < .05$).

Results

The canonical analyses between the SVIB scales and each of the three respective classification schemes resulted in two statistically significant ($p < .05$) canonical factors for each analysis conducted. The statistically significant canonical correlations along with their respective canonical factor structures and redundancy indices are reported in Tables 2, 3, 4.

Insert Table 2

For the Holland scheme, the first canonical factor was found to be bipolar, representing positive loadings on the Enterprising and Investigative types and negative loadings on the Social and Artistic types. Examining the SVIB occupational scales also supports this characterization of the first factor given Holland's typology. The redundancy of the expressed choices, given the inventoried interests, was found to be .13, whereas the redundancy of the inventoried

Table 2

Canonical Factor Structure for Holland's Scheme*

Expressed	Factor I R_{c_1} = 62**	Factor II R_{c_2} = 59**	Inventoried	Factor I R_{c_1} = 62**	Factor II R_{c_2} = 59**
Investigative	48	84	Physician		38
			Psychologist		57
Artistic	-76		Architect	-36	
			Mathematician		
Social	-47	-45	Chemist		29
			Engineer		
Enterprising	51	-76	Production manager	39	
			Army officer	26	28
			Air Force officer	29	32
			Forest Service man	36	
			Farmer		
			Math-science teacher		45
			Rehabilitation counselor		50
			YMCA secretary		46
			Social worker		47
			Social Science teacher		
			School superintendent		37
			Minister	-31	44
			Artist	-43	
			Music performer	-49	25
			Music teacher	-56	38
			CPA		
			Senior CPA	30	
			Accountant	38	
			Office worker	25	
			Purchasing agent	39	-44
			Banker		-53
			Pharmacist	29	
			Sales manager	25	
			Real estate salesman		-42
			Life insurance salesman		
			Advertising man		
			Lawyer		
			Author/journalist		
			Pres., manufacturing concern	29	-27
Redundancy	.13	.13		.03	.03
Total R_{d_x}	.26		Total R_{d_y}	.06	

*Only loadings of .25 or greater are reported.
**$p < .05$

interests, given the expressed choices was only .03. The canonical correlation for this first canonical factor was .62. The correlation associated with the second canonical variate was .59. The second factor, as the first, was found to be biploar with a positive loading on the Investigative type and negative loadings on the Social and Enterprising types. The SVIB occupational scales also conformed to this bipolar structure. The moderately loaded occupational scales appear to conform to this factor definition, except for the Social Service scales, which do not appear to fit the Holland classification. The redundancy of the expressed choices, given the inventoried interests, was only .13, whereas the redundancy of the inventoried interests, given the expressed choices, was .03. This represents a total redundancy of .26 for expressed choices, when given the inventoried interests, and only .06 for inventoried interests when given expressed choices for the statistically significant canonical factors. Although the relationships found are statistically significant, the amount of variance or overlap explained as evidenced by the redundancy indices warrants suggesting the uniqueness of the measures obtained.

Insert Table 3

For Roe's classification scheme, as reported in Table 3, bipolar factor structures were again observed. The first canonical factor, reflecting a Technical versus a Cultural/Arts - Organizational dimension, was found to have a canonical correlation of .65. However, when redundancy indices were computed for this factor they were found to be .11 when given the inventoried interests and .04 given the expressed codings. The second canonical factor, having a correlation of .58, suggests a bipolar structure for the Roe classification characterized as Scientific versus Artistic as a dimension. The SVIB scales however fail to

Table 3

Canonical Factor Structure for Roe's Scheme*

Expressed	Factor I R_{c_1} = 65**	Factor II R_{c_2} = 58**	Inventoried	Factor I R_{c_1} = 65**	Factor II R_{c_2} = 58**
Organization	-26		Physician		-43
			Psychologist		
Technical	96		Architect	33	
			Mathematician		
Science		-93	Chemist	51	
			Engineer	65	
General culture	-49		Production manager	48	
			Army officer	31	
Arts and			Air Force officer	60	
entertainment	-28	59	Forest Service man	38	-29
			Farmer	41	
			Math-science		-33
			Rehabilitation counselor	-39	
			YMCA secretary		
			Social worker	-47	
			Social science teacher	-53	
			School superintendent	-41	
			Minister	-43	
			Artist		
			Music performer		
			Music teacher	-42	
			CPA		
			Senior CPA		
			Accountant		
			Office worker		
			Purchasing agent	28	
			Banker		26
			Pharmacist		-24
			Sales manager		
			Real estate salesman		24
			Life insurance salesman	-33	
			Advertising man	-32	26
			Lawyer	-26	
			Author/journalist		
			Pres., manufacturing concern		
Redundancy	.11	.09		.04	.01
Total R_{d_x}	.20		Total R_{d_y}	.05	

*Only loadings of .25 or greater are reported.
**$p < .05$

provide as convincing a description of such a structure. For this factor, the redundancy of the expressed choices, given the inventoried interests was .09, while the redundancy of the inventoried interests was .01. As was found in the Holland analysis, there would appear to be a vast amount of uniqueness in the separate measures, yet the magnitude of the canonical correlations do support the consideration of parallel underlying constructs.

Insert Table 4

The canonical factor structure for Strong's scheme is presented in Table 4. As observed for the other schema, the first factor is bipolar, reflecting a Physical Science/Technical versus a Social Science/Humanistic dimension. The occupational scales would appear to define this dimension according to these characterizations. The redundancy of the expressed choices, given the inventoried interests was .09, while the reverse redundancy was .08, as extracted from a canonical correlation of .67. The second factor was also bipolar, reflecting a hard Science versus Social Science dimension. The redundancy of the expressed choices, given the inventoried interests, was .06, whereas the redundancy of inventoried interests, given expressed choices, was merely .01. The total redundancies for the significant factors were .15 for the expressed choices given the inventoried measures, and .13 for the inventoried scales given the expressed codings.

Discussion

Observing each of the classification schema, the amount of redundancy remains somewhat constant for the expressed choices, given the inventoried interests. The index is approximately .20 or reflects about 20 percent overlap

Table 4

Canonical Factor Structure for Strong's Scheme*

Expressed	Factor I R_{c_1} = 67**	Factor II R_{c_2} = 53**	Inventoried	Factor I R_{c_1} = 67**	Factor II R_{c_2} = 53**
Biological science		70	Physician		37
			Psychologist		
			Architect	47	
Physical science	73	31	Mathematician	37	
			Chemist	65	
			Engineer	78	
Technical and trade skills	46		Production manager	47	
			Army officer	31	
			Air Force officer	59	
Social science	-56	-74	Forest service	43	
			Farmer	58	
Business and accounting		34	Math-science teacher	28	
			Rehabilitation counselor	-62	
Verbal/ linguistic	-29		YMCA secretary	-32	
			Social worker	-60	
			Social science teacher	-62	-27
			School superintendent	-60	
			Minister	-54	
			Artist		
			Music performer		
			Music teacher	-47	-26
			CPA	-30	
			Senior CPA		
			Accountant		
			Office worker		
			Purchasing agent	26	
			Banker		
			Pharmacist		
			Sales manager	-30	
			Real estate salesman	-30	
			Life insurance salesman	-53	
			Advertising man	-43	
			Lawyer	-42	
			Author/journalist		
			Pres., manufacturing concern		
Redundancy	.09	.06		.08	.01
Total R_{d_x}	.15		Total R_{d_y}	.09	

*Only loadings of .25 or greater are reported
** $p < .05$

between the two sets for all extracted factors. In like manner, the amount of redundancy for the inventoried interests given the expressed choices remains about .06 for the schema investigated. What this information suggests is the extent of the uniqueness of each set of measures. But this finding is not in total contradiction to previous research wherein bivariate correlations between expressed and inventoried interests are often reported in the range of .4 to .5. Results of this investigation would support comparability of the two sets at a somewhat lesser, more marginal level.

In terms of the canonical correlations that were observed, the classification schema studied appear to reflect the same underlying psychological dimensions. Upon close examination two independent dimensions arise. Based upon the first canonical factor from each analysis presented, one dimension reflects what we would term a human welfare versus an applied science factor where the critical element relates to involvement or non-involvement with people. The second dimension appears to be characterized as a technical versus social factor wherein the specific job task defines individual placement.

Results of this investigation indicate that the factor structures underlying the relationships between coded-expressed and inventoried interests are similar over the classification schema examined. Although the relations observed were statistically significant, they represent a small amount of overlap indicating a high probability of observing inconsistent expressed and inventoried interests in subjects. Comparability and consistency would seem to be most readily achieved utilizing independent dimensions of human welfare versus applied science and technical versus social, as presented above, to obtain a proper perspective on the communality between these sets of assessment methodologies.

References

Berdie, Ralph. Scores on the SVIB and Kuder Preference Record in relation to self ratings. Journal of Applied Psychology, 1950, 34, 42-49.

Campbell, David. Comment. Personnel and Guidance Journal, 1968, 46, 434-436.

Campbell, D. P. Handbook for the Strong Vocational Interest Blank. Stanford, Calif.: Stanford University Press, 1971.

Crites, J. O. Vocational psychology. New York: McGraw-Hill, 1969.

Dolliver, R. H. Strong Vocational Interest Blank versus expressed vocational interests: a review. Psychological Bulletin, 1969, 72, 95-107.

Holland, J. L. Making vocational choices: a theory of careers. New Jersey: Prentice Hall, 1973.

Remstad, R. & Rothney, J. W. Occupational classification and research results. Personnel and Guidance Journal, 1958, 465-472.

Roe, Ann & Klos, Dennis. Classification of occupations. In J. M. Whiteley and A. Resnikoff (eds.) Perspectives on vocational development. Washington, D. C.: The American Personnel and Guidance Association, 1972.

Rose, H. A. & Elton, C. F. Ask him or test him? Vocational Guidance Quarterly, 1970, 19, 28-32.

Strong, E. K. Amount of change in occupational choice of college freshmen. Educational and Psychological Measurement, 1952, 12, 677-691.

Strong, E. K. Validity of occupational choice. Educational and Psychological Measurement, 1953, 13, 110-121.